REMARKS

Rejections under 35 USC §102(b)

Claims 1-3 were rejected under 35 USC §102(b) as being anticipated by each of Sato et al. (Sato '970, EPO Document No. EP 1 308 970 A2, cited in the IDS submitted October 16, 2007); Sato et al. (Sato '944, Japanese Patent Document No. 2004-111944, cited in the IDS submitted August 14, 2004); and Sato et al. (Sato '867, Japanese Patent Document No. 2004-153867, cited in the IDS submitted August 14, 2006).

Claim 1 has been amended to recite "wherein said radially anisotropic annular magnet having an inner diameter of up to 90mm and an (inner diameter)/(outer diameter) ratio from 0.3 to 0.7." The amendment is supported in the original specification at paragraphs [0039] and [0052]. Although the upper limit "0.7" does not appear in the original specification, the recitation is supported by the specific example of Embodiment 1 disclosing an outer diameter of 30mm and inner diameter of 20mm. The MPEP explains as follows:

> With respect to changing numerical range limitations, the analysis must take into account which ranges one skilled in the art would consider inherently supported by the discussion in the original disclosure. In the decision in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the ranges described in the original specification included a range of "25%-60%" and **specific examples of "36%"** and "50%." A corresponding new claim limitation to "at least 35%" did not meet the description requirement because the phrase "at least" had no upper limit and caused the claim to read literally on embodiments outside the "25% to 60%" range, however a limitation to **"between 35% and 60%" did meet the description requirement.**

(MPEP, 2163.05, III, emphasis added). Thus, in *In re Wertheim*, lower limit "35%" met the description requirement by the specific examples of "36%." Therefore, the upper limit "0.7" in claim 1 is supported by the Embodiment 1 having an (inner diameter)/(outer diameter) ratio of 20mm/30mm (0.67).

Sato '970 and Sato 944 do not teach or suggest "wherein said radially anisotropic annular magnet having an inner diameter of 90mm and an (inner diameter)/(outer diameter) ratio from 0.3 to 0.7," as recited in amended claim 1.

The following table shows the (inner diameter)/(outer diameter) ratios disclosed by the present specification.

Present Invention	Outer diameter	Inner diameter	**Inner/Outer Ratio**	Length
Claim		<90	**0.3-0.7**	
1	30	20	**0.67**	30
2	8.2	3.5	**0.43**	18
Sato '867	Outer diameter	Inner diameter	**Inner/Outer Ratio**	Length
1	30	25	**0.83**	30
2	30	25	**0.83**	30
3	30	25	**0.83**	30
4	30	25	**0.83**	30
5	30	25	**0.83**	30
6	24	19	**0.79**	30
7	24	19	**0.79**	30
8	24	19	**0.79**	30
9	24	19	**0.79**	30
10	30	25	**0.83**	30
11	30	25	**0.83**	30
12	30	25	**0.83**	30
13	30	25	**0.83**	30
14	30	25	**0.83**	30

Sato '944	Outer diameter	Inner diameter	**Inner/Outer Ratio**	Length
1	26	19	**0.73**	27
2	26	19	**0.73**	27
3	26	19	**0.73**	27
4	26	19	**0.73**	27

Thus, the embodiments in Sato '970 have (inner diameter)/(outer diameter) ratios of 0.79 and 0.83, which is significantly higher than the upper limit of the (inner diameter)/(outer diameter) ratio of the present invention. Also, the embodiments in Sato '944 have (inner diameter)/(outer diameter) ratio of 0.73, which is also significantly higher than the upper limit of the present invention. When the (inner diameter)/(outer diameter) ratio becomes about 0.8 or more, the annular magnet usually is sufficiently thin not to cause thermal stress cracking.

Stress develops in a magnet due to radial orientation in circumferentially continuous body, and the stress can be reduced by alleviating the radial orientation. The radially anisotropic annular sintered magnet prepared by the method of the present invention is made such that its remanence in a radial direction of the annulus increases and decreases at intervals of 90° in a circumferential direction of the annulus. In other words, the remanence in a radial direction increases and decreases with four periods over the entire circumference (360°) in a circumferential direction of the annulus. The remanence in a radial direction reaches maximum and minimum at four points with 90° intervals. The region where orientation is disordered or discontinuous exhibits the minimum remanence in a radial direction.

The radially anisotropic annular sintered magnet obtained by the present invention effectively reduces the torque ripple by the existence of the regions where orientation is

disordered where remanence is low, which is distributed at 90° intervals in a circumferential direction of the annulus.

Here, the region of disordered orientation extends continuously from one end to the other end of the annulus in its axial direction, and the occurrence of cracking is thus prevented throughout the axial direction of the annular magnet. It should be noted that, at the region of disordered orientation, the remanence is low not because this region is oriented in a direction different from the radial direction, but because the magnet particles composing this region are randomly directed. Thus the stress which can induce cracking is effectively alleviated. Although the regions with disordered orientation are of minute volume, they effectively prevent cracking because they are distributed at four places.

According to the method for preparing a radially anisotropic annular sintered magnet of the invention, the remanence of the magnet in a radial direction has a minimum equal to 50 to 95% of the maximum. At the region of disordered orientation, the remanence in a radial direction exhibits a minimum. The setting that the minimum of the remanence in a radial direction is equal to or less than 95% of the maximum of the remanence in a radial direction has an effect of suppressing cracking. If the minimum of the remanence in a radial direction is less than 50% of the maximum of the remanence in a radial direction, magnet particles are aligned and oriented in a certain direction other than the radial direction, and the magnetic flux at this region makes a discontinuous change from the magnetic flux of the surrounding region, causing torque ripples. In order for a motor having the magnet incorporated therein to produce an

effective torque, the maximum of the remanence in a radial direction over the entire circumference of the annulus is 0.95 to 1.60 T.

For at least these reasons, claim 1 patentably distinguishes over Sato '970 and Sato '944. Claims 2 and 3, depending from claim 1, patentably distinguish over Sato '970 and Sato '944 for at least the same reasons.

Sato '867 is a Japanese application corresponding to Sato '970. Therefore, claims 1-3 patentably distinguish over Sato '867 for the same reasons discussed above.

Double Patenting Rejection

Claims 1-3 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 to 5 of U.S. Patent No. 7,201,809 and claims 1-7 of U.S. Patent No. 6,984,270.

As discussed above, Claims 1-3 patentably distinguish over Sato et al, which corresponds to U.S. Patent No. 6,984,270.

Regarding the double patenting over U.S. Patent No. 7,201,809, Applicants submits a terminal disclaimer attached hereto.

Therefore, the rejection on the ground of nonstatutory obviousness-type double patenting should be withdrawn.

In view of the aforementioned amendments, accompanying remarks and the terminal disclaimer, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

Sadao Kinashi

Sadao Kinashi
Attorney for Applicants
Registration No. 48,075
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

SK/ar